In Two Parts—Part One

AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry

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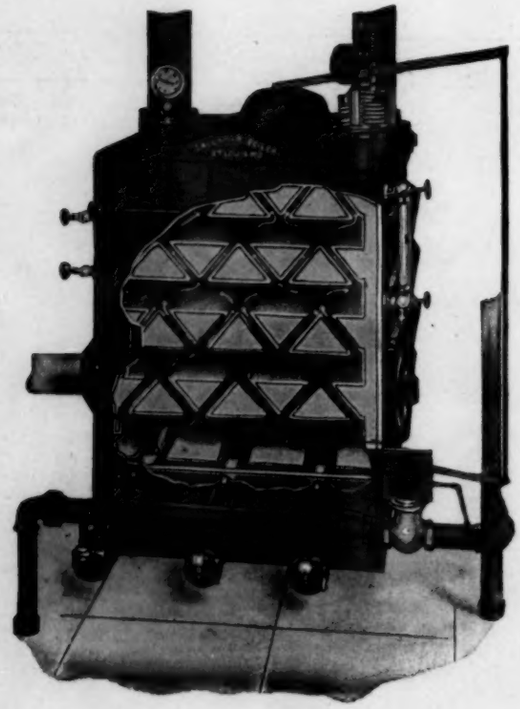
Advantages of the Gallaher Boiler



Gallaher Boilers, when used for heating water in connection with storage systems, are furnished with Thermostat which automatically controls gas supply and temperature of water.

THE GALLAHER GAS-FIRED BOILER will fit right into the present steam or hot-water system. It produces no smoke, no dust, no dirt, no soot, no odor, and all the burned products are conducted to the chimney, thence out of doors.

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SIXTY-FIFTH YEAR

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"APPLICANT FOR MEMBERSHIP IN THE AUDIT BUREAU OF CIRCULATIONS"

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AMERICAN
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Trained Employees for Public Utility Service *

The importance of the human element in public service work

Arthur Williams

A REMARK made some years ago by Dr. Arthur Twining Hadley, former president of Yale University, made a lasting impression upon the memory of the writer. It was to the effect that "Business cannot with safety dispense with the trained mind." The evident truth of this statement, especially in its application to public utility service, is increasingly apparent as the years pass. There has probably never been a higher degree of appreciation than at the present moment not only of the value, but the necessity, of the trained mind in every branch of modern business.

Technical Training and the Human Element

In the technical side of our industry—that department of it which is concerned with coal, steam machinery and equipment, on the one hand, and with design, construction and operation on the other—we have always recognized the need for the trained mind. But in the past, the human element—that department of our work in which human beings are the important and decisive factors—has received so little special training that in some instances an almost negligible appreciation of the importance of such training is indicated. We have often given a complete and perfect technical service side by side with very insufficient and indifferent human service. Possibly this is one of the reasons why the part we play in the civic and economic life of the country is not more fully appreciated by our customers and the general public.

Apprenticeship System

Industrial training, in the technical sense, has been a familiar idea for centuries. The apprenticeship system is an illustration. Incidentally, serving an apprenticeship, whether in the arts or in mechanics, constituted an educational training, not only in technical, but human values. The apprentice acquired many of his master's qualities, good or bad, and that system developed some of our most eminent and highly successful men.

Need for Trained Minds: Their Intrinsic Value

Step by step with the advance of the utility business, which has grown until it now reaches practically every phase of human life, our appreciation of the need of the trained mind has developed, not only in the case of special departments, but in every domain of our work. We are learning that we are just as neglectful of our interests and public obligations when we place an untrained, incompetent employee in a position where he comes in touch with any phase of our public relations, as we would be should we put untrained or incompetent men in charge of the complicated installation and operation of our great plants. We are beginning to realize that one of the great assets of our industry is the highly developed intelligence of many of its men and women working in close co-operation and co-ordination, seeking and serving ideals, based upon the highest attainable principles of corporation conduct. Such minds represent, individually and collectively, definite tangible values, in the same sense that the material elements of our industry are valuable.

Good Will Only Through Competent Agencies

One of our prominent executives has stated that the greatest asset of a utility is public good will. This cannot be secured without proper effort through competent agencies. To be competent, such agen-

*Address before the Empire State Gas and Electric Association, at Lake Placid, October 7, 1924.

cies must be trained. We must seek and define the elements that enter into the winning of good will, and leave nothing undone to secure it. We must acquire a personnel service comparable with our technical service—and this can be obtained only by adequate training.

Responsibility Begins With Technical Service

It is not sufficient for a public utility to secure customers, nor to consider that its responsibility ends with rendering them a technical service even of high order. As a matter of fact, our responsibility only begins with our technical service. Every phase of customer relationship must be so conducted that the greatest degree of satisfaction, even gratification, results, and this can be brought about only through properly trained and competent human agencies.

Public Sense Acute

And in this connection we must remember that we are dealing with a public quick to resent discourtesy and inefficiency, and equally quick to appreciate good service based upon the high principles and ideals which very generally guide and actuate the gas and electrical industry of our state and country.

Each Problem Individual

Each industrial group coming in contact with the public must define and solve its own educational requirements. These must be formulated with regard to the kind of service rendered and partly upon general conditions attendant upon that service. In our utility field we must keep our commodity at the highest attainable standard and supply it at the lowest cost consistent with good service. However, such quality of service does not end our obligation to our customers and the public, or even to the industry. We must render it in such fashion that the human contacts and relationships which result will convert our customers into friends.

Courtesy Prime Requisite

In bringing this consummation about, courtesy is one of the predominant necessities. The courteous man or woman is seldom an accident. Nor must courtesy be a matter of chance. It must become a habit, partly natural, partly acquired, and, in our industry at least, it must be extended to all alike. To make this conception absolutely clear, one of our member companies has instituted the rule that the degree of courtesy and attention accorded a director of the company shall be the measure of the company's attitude to every customer, however small; to every member of the community without reference to race, creed or color or relative position.

Misrepresentation Not to Be Tolerated

Absolute honesty is another requisite. Lying or even misrepresentation can never be tolerated with safety in our public relations—apart from the moral question involved. No utility can afford to be dependent upon the slightest deviation from fact. Where it is permitted, a breakdown may be anticipated of the morale of the company's own employee organization, while distrust, dissatisfaction and suspicion are inevitably sown in the minds of the customers and the public. Adequate training of the employee force involves such careful selection of competent representatives that the employee is not tempted to misrepresent nor will the public have cause to infer misrepresentation.

Division of Duties

To avoid the possibility of any such inference the rule of one company member is that a representative engaged in securing new business shall never, as a matter of organization, be charged with the duty of attending to customers' complaints, complaints, either in respect to the quality of the service or its cost. The reason for this is obvious when it is realized that the typical commercial representative seeking customers is normally sympathetic and responsive, which, in most instances, makes it difficult for him to disagree with any theory advanced by a client. Thus, a customer who questions his bills and, incidentally, the accuracy of his meter, must not be turned over to a salesman, but to an employee who, through training and experience, has developed a complete faith in a meter as a measuring instrument so long as its intended function is being properly performed. Consciously or unconsciously, this attitude of mind is conveyed to the complaining customer whose reaction is correspondingly affected.

Importance of First Point of Contact With the Public

Another illustration of the need for specialized training lies in the supremely important matter of receiving our public with politeness and consideration at the first point of contact, namely, at the very door of the office. Whether the representative is the characteristic office boy or some older employee, there should be always in evidence the utmost of attention and courtesy, prepared to render some definite service, great or small. From this point of view, our office boys are probably more important than our presidents, for, while the latter are probably always polite, considerate and helpful, they come personally in contact with but a very small per centage of the public upon whose opinion our ultimate destinies depend.

The Telephone

In similar degree, although its importance is not always recognized, the speaking voice of the telephone operator and of each representative with whom the public comes in touch over the telephone, is of far greater moment than the singing voice of any prima donna. A defect in the voice of the latter may affect discriminating music lovers unpleasantly

(Continued on page 37)

Gasification of Low Value Fuels

Converting them into useful gaseous fuel and tar

Walter Freund

(The use of fuels of low thermal values in the gasification process and the recovery from them of valuable gaseous fuels and other by-products are matters that interest gas men all over the world. They may not be so pertinent in this country, where the supplies of special gas-making fuels are still very large, but nevertheless they are interesting to those who have and are undertaking to utilize some of the low grade fuels that are available in such large quantities in the United States. The principal value of articles of this nature is to record the results that have been obtained in actual operating practice, under conditions which though they may not be duplicated over here from all angles, nevertheless are possessed of sufficient similarity to operating practice in America to make these results of interest and some value to American gas men. The original of this article was published in Chemiker Zeitung.—Editor.)

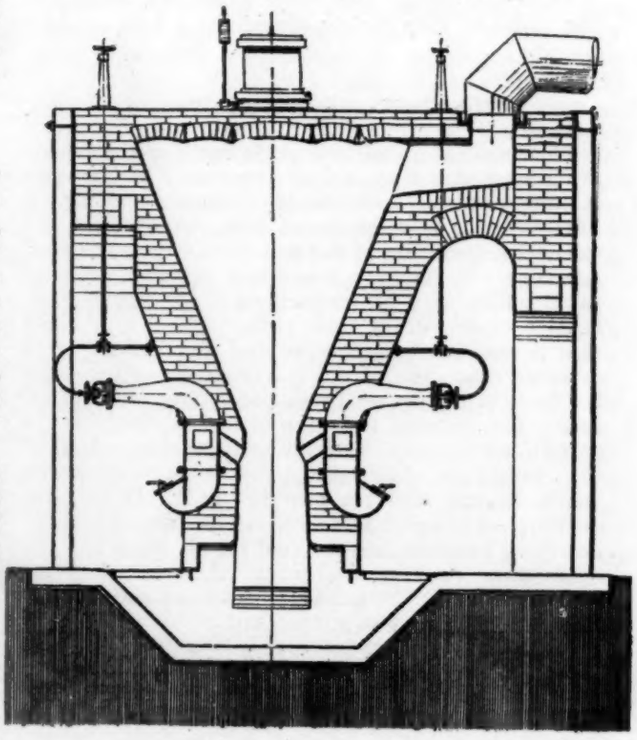
THE possibility of using low value fuels by preliminary gasification and subsequent purification of the gas that is produced from them, which is then employed for heating purposes or for the generation of power, is a matter that has been given but little attention by technical men who are concerned with these problems. It has not been realized that it is possible to obtain an overall efficiency in this manner, which is much better than that which is ordinarily secured in heating and power production operations. This has particular reference to the production of power by steam.

This is an important matter and it depends in the first place on the use of a gas-producing apparatus which will make gas with the least difficulty and which will be free from all the operating difficulties that generally surround such apparatus, especially when they are employed in the gasification of low grade fuels. It is true that a great number of gas-producing apparatus have been designed for this purpose, but which have not given the results that were expected of them. Then, again, it must be remembered that in the gasification of low-grade fuels an apparatus is required which will be able to handle materials that contain considerable quantities of water. The gasification of such carbonaceous matter involves problems which are of the greatest significance to the success of the process, for during the progress of the gasification the volume of the carbonaceous matter increases very largely and difficulties arise in the operation and manipulation of the gas producing apparatus.

Steam Production from Degasified Coal

One arrangement has been suggested which consists in locating the gas receiving apparatus close to the boilers, so that the fuel, after it has been gasified, may drop onto the grates of the boilers and be burnt there for the production of steam. It is claimed that in this manner it is possible to burn up all of the fuel without any loss of unburnt carbonaceous matter and that the overall efficiency that is gained thereby is greater than that which is obtained in the ordinary firing of the boilers.

A part of the combustion gases that are derived from the boiler furnaces is used in carrying out the tumefaction of the coal, these gases being led through the generator that is employed for this purpose. These combustion gases, which consist mainly of water vapor and carbon dioxide, undergo reduction during the course of this process and are able to generate hydrogen and carbon monoxide, which are mixed with the gases that are driven off from the coal during the tumefaction. The apparatus that is employed for the precipitation and removal of the tarry matters from the gas is similar to that ordinarily used for this purpose in coke oven plants and gas works. In the city electric works at Lichtenberg, Germany, such an arrangement has been used for more than one year, connected with a boiler which has a capacity of 500



square meters of heating surface. Good results have been secured by this method of running the boilers.

Advantages of the Process

When the fuel is fed into the generators or producers it is found that more complete combustion of the combustible takes place than when the coal is burnt on the grate. The reason for this is that in the combustion of the fuel the process takes place in the presence of an excess of air, which has a cooling effect on the gases of combustion that are obtained by burning the coal on the grate. In the gas generator the fuel is burnt with a limited amount of air, which is known as primary air, and carbon monoxide gas is produced. This gas can then be mixed with secondary air and burnt under the furnace or the boiler to give carbon dioxide as a final product.

The Gasification Process Proper

The gasification of low-grade fuels in the generating apparatus that is most commonly used in gas-making plants is a matter of considerable difficulty. Such practice is often beset with interruptions and the entire operation of the apparatus becomes unsatisfactory. It has been found that one type of apparatus which may be recommended for use in gasification of low-grade fuels is the cone-shaped affair that is seen in the accompanying illustration. This inverted cone generator is particularly well-adapted for fuels of the lowest grade containing much moisture. The peculiar structure of the apparatus is apparent, particularly the small cross-sectional area of the combustion chamber and the special blast distribution devices that are provided in it. This is for the purpose of assuring a thorough penetration of the gasifying medium into the coal that is filled into the apparatus. Another feature is the air-tight connection between the gasifying chamber and the ash pit and the absence of grates and all movable apparatus. Thus, this apparatus is entirely different from the rotary grate type of generators which have been designed and used for the gasification of low-grade fuels. It is no grate at all and there is no power required for rotating the grates as in the aforementioned type of generators.

In spite of the simple construction of this generator and the lack of any iron construction in the combustion or generating zones, as is customary in the construction of most types of gas-producing apparatus, it is necessary to exert considerable care in its operation in order to obtain satisfactory results, both from the technical as well as the economic side. The first cost of such a simple apparatus is, of course, less than that of the more complicated types. Furthermore, due to the fact that the number of parts in this apparatus has been kept down to a minimum, and also that the temperatures that are found within the apparatus during its operation are very moderate, the life of the generator is long.

Operation of the Generator

Due to the fact that the combustion zone of the generator is small, smaller than in most of the other types of gas-producing apparatus that are commonly used for the gasification of low grade fuels, it is found that it is not necessary to use as much excess air in the gasification operation as is the case in the others types of producers. In fact, the inverted cone type of gas generating apparatus operates almost with the theoretical amount of air that is required for combustion and its efficiency is therefore found to be between 85 and 90 per cent.

The combustible matters fed into the apparatus are quickly and uniformly gasified. The temperature in the combustion zone of the apparatus is so low when this is taking place that only a low grade of fire brick is required for building the internal walls of the apparatus. The gas that is produced in this inverted cone generator leaves at an approximate temperature of 70 to 120 degrees C, so that it is not necessary to install costly cast-iron piping systems for leading this gas away. Ordinary sheet metal conduits of two to three millimeters thickness are sufficient for this purpose. Not only is a saving effected in this case, because of the lower cost of the piping, but an advantage is also gained in that complete condensation of the volatile constituents of the gas is possible because of its low temperature. Furthermore, this can take place in a short section of piping, so that a gas free from all tarry vapors is made available.

Mechanical Resistance of Generator

The mechanical resistance of the generator is only small because of the narrow gasification chamber. For that reason also the consumption of steam in the injectors is small. These injectors are employed for sucking through the air that is employed for combustion purposes. No excess steam is introduced into the apparatus, which will afterwards appear as a dilutent mixed with the gas that is evolved in the generating apparatus. However, a sufficient amount of steam is allowed to enter the generating apparatus as will decompose by coming in contact with the hot incandescent carbonaceous matter. The result of such operation of the generator is that a gas is obtained with a correspondingly high heating value. The operation of the gas generating apparatus at a low temperature, the lack of grates and similar devices in the apparatus, which usually make the ash and clinker hard to remove, with the result that the machine has to be shut down for cleaning purposes, make it possible to gasify low-grade fuels without the formation of clinker that cannot be employed in other types of generators. Thus it is possible to gasify combustible matter that contains as high as 60 per cent of moisture and of any size of particles in this apparatus with good results and with no interruption of the process. Due to the low temperature at which the operation is carried out,

(Continued on page 39)

GAS MERCHANDISING

Domestic – Industrial

Ideas for the Man Who Sells

William H. Matlack

Saturation Record

IN order to know just what to aim at, many of the gas companies are making a survey of their lines with the view of learning just how many

SATURATION RECORD

Name _____ Date _____

Number _____ Street _____ Phone _____

	Make	Sold		
Ranges				
Tank Heater				
Storage Heater				
Automatic Heater				
Portable Heaters				
Hot Plate				
House Piped				

Calls made by: _____ Date _____

(over)

Figure 1

prospects there are on existing distribution systems, for new users, for water heaters, ranges and various other appliances. These surveys are made by calling at every house on the company's mains and recording each and every appliance used or possessed by the

NON-USER DATA

Service in building _____ Size _____

Has used gas? If so, where? _____

Remarks: _____

Date Call Back	Interested in	Sold

(over)

Figure 1a (reverse side)

customer. This data is tabulated on a card, as illustrated by figure one, in one instance, and in another on the card, illustrated by figure two. In the latter instance the figures at the top of the card correspond to the list of appliances that each customer may own or be a prospect for, and are used as flags for mailing literature to the customer or for the salesman's information in making calls upon the prospect. Only such numbers as correspond to the appliance, for which it is assumed the customer is a prospect, are left on the top of the card, the others being cut off by the clerk who has charge of the file, as the customer purchases appliances. This card also provides information regarding the customer's meter and a couple of lines to indicate how often the customer has been sent direct advertising.

1 2 3 4 5 6 7 8 9

GAS APPLIANCE RECORD CARD

Name _____

Number _____ Street Avenue _____

1. Ranges — Cabinet _____ Box Type _____
2. Tank Heaters — Size Tank _____ Gal. _____
3. Automatic Heaters — Number _____
4. Portable Heaters — 5. Radiators—No. Section _____
6. Gas Iron
7. Hot Plates — 1 Br. _____ 2 Br. _____ 3 Br. _____
8. House Piped — No. of Drops _____
9. Co. No. _____ Maker & No. _____ Size _____ Type _____ Index _____

REMARKS _____

Date | | | | | | | | | | | | |

Form

Figure 2

What Continuous, Consistent Advertising Will Do

Not long ago we talked to a man who said he was the new business manager of a gas company. We were trying to sell him the idea of putting a little selling into the white space he was purchasing now and then from the newspaper folks in his town. We

also suggested that he plan his advertising and lay out a schedule that would permit him to have an advertisement in the newspapers each day. "Continuous, Consistent Advertising," we said, "is the only kind that pays." When he came back at us with: "What do you claim for such advertising? What will it accomplish?"

"You may rest assured," we told him, "that such an advertising plan will enable your company to reach all classes of prospective customers that your salesmen would never reach, for one reason or another. It would increase the sale of the merchandise and commodity and service which your company sells. It would cause dealers who were selling appliances to sell better appliances and cause those who were not to take on appliances, thus increasing the sale of gas service. It would facilitate the legitimate influence of legislation where such influence was desirable. Truth in advertising creates prestige and favorable public opinion. It would attract and hold a better class of employees, as live ones like to be associated with others of like character. It would attract the type of salesmen who sell without circus methods and come-backs. The gas company can ill afford to be represented by the so-called speed artist who deviates with every sale, and leaves a trail of kicking customers. It would build up loyalty in the organization. It would enhance the purchasing power of the company. It would attract the right sort of buyers and facilitate collections. It would render the field more efficient and eliminate cheap competition."

All this and more, for the simple reason that if it was real advertising, conducted continuously and consistently, it would be highly educational, for, after all, when you sell a man a service or an appliance you first must sell him an idea and while you are selling, why not sell en masse? Why not educate folks by advertising?

Salesman's Report

The form reproduced here is a daily report that the district salesmen of the Laclede Gas Light Company, St. Louis, are required to turn in each day, showing orders taken. The average salesman resents a lot of paper work and it is well to make the report forms as short and snappy as is possible for best results.

THE LACLEDE GAS LIGHT COMPANY

SALESMAN'S DAILY REPORT ..... BRANCH

DIVISION ..... NAME .....

DISTRICT ..... APPLICATIONS TAKEN DATE ..... 191..

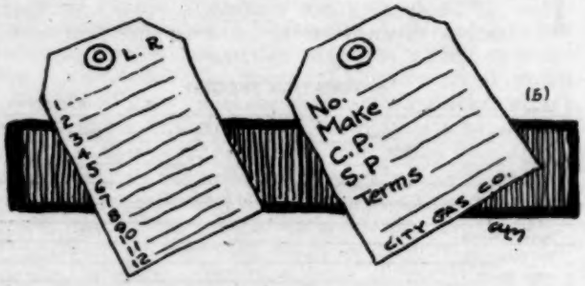
NAME	LOCATION	Floor	Burners	Meters Connected	Old Gas Fixtures Removed	Amount Collected

APPLIANCES SOLD AND CONNECTION ORDERS TAKEN

NAME	LOCATION	Floor	Description of Order	Selling Price		Amt. Collected	

How Many on Hand?

The sketch shown here illustrates the method employed by one dealer to keep an inventory of ranges on hand at all times. The number of each type of range is listed on one side of the tag, right and left ovens, and as a sale is made the salesman mak-



ing the sale checks it off, only one model being on the display floor at a time. This keeps the record up to date at all times. On the reverse side of the tag is listed the number, make, cost price and selling price of the range, with the terms on which it is sold. These tags are tied on the oven racks.

Reminder Advertisement

Advertise, if you only run a reminder advertisement. Use an inch by one column or an inch and

one-half by one column. Have a local artist make you some hand-lettered advertisements for such space and impress him with the fact that you are running reminder advertisements and that you expect white space to dominate. Keep everlastingly before your customers, change your copy, and get in some sales stuff. Do not pay for white space for announcements.

PROGRESS IN GAS TECHNOLOGY

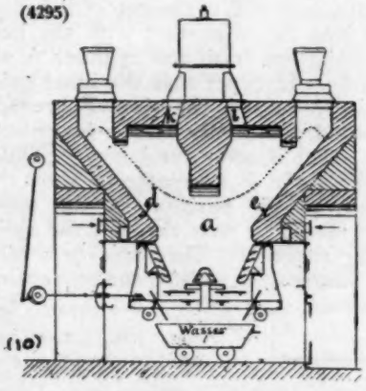
Domestic and Foreign

Preheating Coal

A SERIES of experiments were carried out to determine the effect of pre-heating a non-coking coal. The heating was conducted in a vacuum at varying temperatures. It was found that the rate of absorption of oxygen was materially decreased by this treatment, and that the diminution is greater the higher the temperature of pre-heating above 300 degrees C. For further details the reader is referred to Chemiker Zeitung, 1924, 48.

Generator With Automatic Removal of Ash

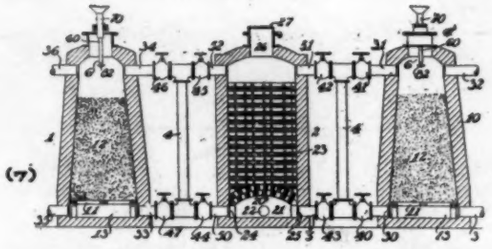
THE accompanying illustration shows a type of generator which has been patented in German Patent No. 353,650, and which is characterized especially by being provided with an arrangement for the automatic removal of the ash that is produced by the combustion of the fuel within the same.



It is seen that the interior walls of the generator, shown at d and e, are made to incline at a certain angle, and in the center of the combustion chamber there is located another wall, i. This serves to divide the latter into two parts and the gas that is made in this apparatus escapes through the openings k and l, which are placed one on either side of the separating wall, i.

Making Water Gas

WATER gas is made in an installation which consists of two generators, shown at 1 and 10 in the accompanying illustration, which are both connected to a superheater, 2. This superheater is located between the two generators and special piping and valve controls are provided so that it is possible to connect either one of the generators with



the superheater, and use the latter for recovering heat and then absorbing the same in the air that is blown into the generator. The apparatus is patented in United States Patent No. 1,519,523.

The Water Content in Tar

SUDDEN increase in the water content of tar takes place apparently without reason. In a number of gas works it was observed that after the water content of the tar had remained around 5 per cent for a period of time, it suddenly increased to as high as 12 to 15 per cent. It is doubted that the oven temperature is responsible for this phenomenon or that better results are obtainable when the retorts are filled completely with coal. It has also been said that the high water content in the tar is due to the presence of benzol wash oil in it.

It is pointed out in the article, which was published in Gas und Wasserfach, 1924, page 521, that when gas liquor is mixed with the tar, it is a very difficult matter to separate it from the tar. There appears to be a chemical combination between the two. Furthermore, it was determined that the more water in the tar the greater the percentage of carbon in it. It was also pointed out that when the cooler was overloaded a mist is formed which results in a very intimate admixture of water and tar, with the result that an emulsion ensues which cannot be broken down.

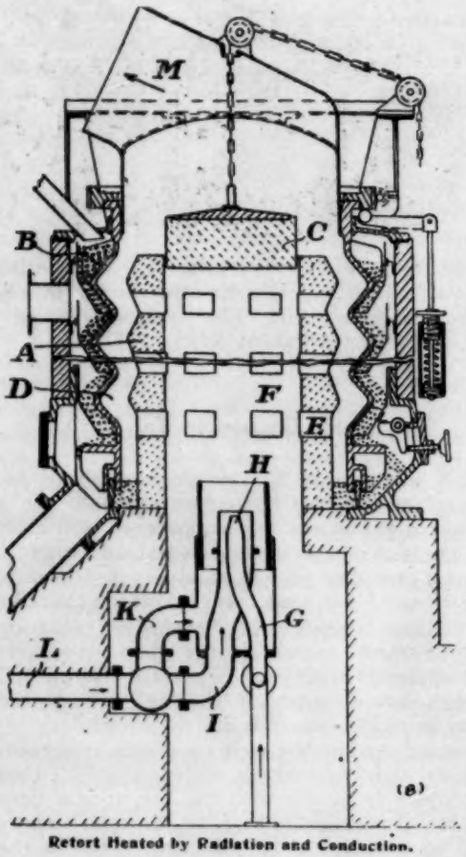
Carbonizing Retort

IN order to overcome the loss of heat in the carbonizing of coal due to bad transmission by conduction, it is suggested that a heat radiating body of refractory material be employed. This body is located near the heating surface of the retort and is heated by the hot gases and in turn passes on the heat to the walls of the retorts. Then by passing the hot gases further along the retort heating takes place by direct contact.

The apparatus in which this process of gasification is carried out is shown in the accompanying il-

lustration and is patented in British Patent No. 205,101.

The retort furnace consists substantially of a massive hollow cylinder A made of refractory material, the outer wall of which is corrugated. This cylinder is surrounded by a second cylinder B of corrugated cross-section, made of cast-iron. The outer surface of this cylinder B serves as heating surface for the charge. The upper end of the hollow cylinder A is closed-in by a movable block C made of refractory material. This is moved by any suitable lifting mechanism. The annular space D, which is formed between the two cylinders, communicates with the inner space F of the cylinder A through the slots E. Heating gas is passed into the inner space from the gas pipe G, and is burnt on issuing from the burner H. The air for combustion, the quantity of which is adjustable by regulating members not illustrated, is fed in through the pipe I. For the purpose of adjusting the temperature of the heating gases, a by-pass K is mounted on the main air-inlet pipe L, through which the necessary quantity of additional air is fed to the combustion gases.



Retort Heated by Radiation and Conduction.

The invention operates as follows: The heating gases burn with a needle flame extending into the inner space F, and there mix with the additional air fed in through the pipe K. The action of the heating gases is first to heat the inner cylinder A from the inside outwards. From the inner space F the heating gases pass into the annular space D, through the slots E and thence escape into the outer atmosphere through the outlet M, or they are further used in heat exchanging apparatus, as, for example, in a pre-heater. During their passage they heat the cylinder A from the outside, and at the same time the outer cylinder B from the inside. The effect is that the heating surface or wall of the retort is heated by being brought into direct contact with the heating gases and by radiation from the cylinder A acting as a heating body. In order that the inner cylinder may be effectively heated, the slots F are advantageously disposed principally at the lower end of the cylinder D—that is, near the burner. Thus the flame enters the space F a greater or shorter distance, according to the position of the movable block C, and is forced to pass through the cylinder and the annular space D. The same or a similar effect may be secured by a different movement of the heating gases.

Gas at an Industrial Exposition

The accuracy and reading of a meter explained

Charles W. Geiger

THE accompanying photo shows the interesting and educational exhibit of the Pacific Meter Works at the recent Annual California Industries Exposition, held in the San Francisco Civic Auditorium. This was purely an educational exhibit. The purpose of installing the various devices in their booth was to create confidence on the part of the public in the accuracy of gas meters.

How to Read a Meter

The most interesting feature of the exhibit was the immense demonstration index which was built especially for the occasion and which was used for the purpose of teaching gas users how to read a meter. This index was seven feet in length and four feet wide, being supported on the wall, and was operated by a sprocket and chain drive in the rear.

(Continued on page 37)

As The Journal Views It

GAS FOR EMERGENCY LIGHTING

It may be true that a great many gas men feel that, as far as lighting is concerned, gas has been finally and irretrievably supplanted by electricity. It may be true that the lighting business as a whole has been lost to gas. It may be considered that the advent of electricity into the lighting field was an important step in the development of modern specialization, and that as such it should not be combated.

But, in spite of all these beliefs and opinions, the fact remains that gas possesses certain intrinsic and important advantages, not only as a fuel, but also as a lighting medium. It is not intended to compare electricity with gas as a general means for producing illumination, for the fact remains that electricity does possess certain very valuable characteristics of its own as a lighting agent. There is no question but that electricity offers many attractive possibilities that gas does not possess, but, on the other hand, it is equally true that for certain special purposes gas is more reliable and better than electricity, as far as illumination is concerned. In other words, it is necessary to view this whole problem of emergency lighting with gas in a broad spirit and to give credit where credit is due, while at the same time exacting due consideration and attention to certain facts regarding gas lighting as they actually exist.

The importance of gas as a lighting medium is in emergency systems. In other words, gas is to be called upon when electricity fails, and electricity fails quite often, particularly in small towns, where the power plants are not protected with expensive apparatus and other means for insuring a continuous supply of the current.

It must be remembered that electricity, as a general rule, cannot be stored, and that once the generator stops turning there is no more current to be had until it starts again. On the other hand, gas is made and stored to a certain degree, and it may happen that part of a gas plant may be temporarily out of order and still the consumers on the line will be uninterruptedly supplied with gas.

Under certain conditions, it is always necessary to have light. For example, it is always necessary to light the streets of a city and the stores where valuable merchandise is displayed; it is always necessary to light theaters and public halls of amusement and meetings where large crowds collect. Electricity can fail, as has been indicated, for many reasons that might necessitate the shut-down of the generator, and when such failure does occur, unless there is an emergency gas-lighting system, the street, theater, hall or store will be thrown into pitch darkness.

It can readily be realized that such an occurrence might be very dangerous. Cases are on record wherein is described losses of goods by theft when stores were suddenly thrown into darkness. Accidents have also happened on streets when the electric lighting system failed. It is a fact that some cities and towns have insisted on passing laws requiring an auxiliary gas lighting system, to take the place of electricity when the latter fails. It has been recognized by certain communities that electricity is not as dependable as gas and that, while the current possesses other distinct and important advantages over gas as a lighting medium, nevertheless gas is superior as far a dependability is concerned. It has thus been deemed worth while to supplement electricity with gas and to combine in that way all of the advantages of both systems.

Our intention is just to indicate that gas is not wholly obsolete as a lighting medium in any sense of the word. It has still a distinct place in this field; it possesses one certain characteristic that no other lighting medium has, and that is its superior dependability, and on this can be built the gas-lighting system of the future. There is no reason for believing that the gas company can do no more lighting business or that it should not do any more lighting business. On the contrary, it is up to the gas industry to interest itself in educating the architect and the builder and the ultimate consumer to the fact that in his house there should be installed not only fixtures for electric lighting, but for gas lighting as well.

Program of the Mid-Winter Gas Conference

Meeting to be held in San Francisco

Address of Welcome—E. L. Hall, president, Pacific Coast Gas Association, Portland, Ore.

Opening Remarks—H. C. Abell, president, American Gas Association, New York, N. Y.

General Remarks—W. E. Creed, president, Pacific Gas & Electric Company, San Francisco, Cal.

1. Gas Making Methods and Materials

Leader, Henry L. Doherty, Henry L. Doherty & Co., New York, N. Y.

In the interest of the public service and of conservation of natural resources, it is necessary that gas companies shall be free to furnish any gas that will do the work. Based on studies of:

(a) Gas making materials available and probability of supply over a term of years.
(b) Conservation of natural resources.
(c) Use of available apparatus.
(d) Changes in, and modifications of, present apparatus to meet present and probable future conditions.
(e) New generating apparatus and its adaptability to future requirements, with full consideration to the trend of development. Full consideration of operating costs and investment.

The scope of the above discussion includes consideration of the following topics:

Gas reforming.

Immediate and ultimate supply of oil for gas making.

Oil gas manufacture on the Pacific Coast and its adaptability further east.

Complete gasification of coal.

Low temperature gasification.

Combination of water and coal gas plants.

Continuous study of gas making methods, etc.

Leader of discussion on "Gas Reforming," H. L. Masser, Los Angeles Gas & Electric Corp., Los Angeles, Cal.

Leader on Oil Gas Manufacture, W. S. Yard, Pacific Gas & Electric Co., San Francisco, Cal., and G. E. Whitwell, Tacoma, Wash.

2. Rates, Rate Schedules and Charges for Gas

Establish the necessity of designing rates and a schedule of charges which should be paid for gas based on the cost which each consumer occasions the company.

New fields for gas service, with special attention to house heating.

Above topic to be led by H. M. Crawford, Pacific Gas & Electric Co., San Francisco, Cal.

Investigation to definitely determine a consumer's maximum demand on a fifteen-minute to one hour basis.

Investigation of the diversity of consumers' demands.

Paper on why is it necessary to charge over a dollar for gas that costs 30c in the holder? Comparison with some known business.

Paper to be prepared by Ewald Haase, Milwaukee Gas Light Co., Milwaukee, Wis.

3. Competition

Leader, Henry O. Loebell, Combustion Utilities Corporation, New York, N. Y.

Present and probable competition from electric, oil, industrial gas plants, etc.—or reverse, how to replace above with city gas.

Displacement of gas by oil; present state and probable future.

Displacement of gas by electricity; present state and probable future.

Study of individual gas plants, oil producer plants, etc., and how to displace by use of city gas.

Discussion on displacement of gas by oil and electricity (by W. G. Vincent, Pacific Gas & Electric Company, San Francisco, Cal., and D. J. Young, Tacoma Gas & Fuel Company, Tacoma, Wash.

4. Public Relations

Leader, B. J. Mullaney, Peoples Gas Light & Coke Co., Chicago, Ill.

Improvement of co-operative work for the benefit of the industry. Home service; educating householders to maximum use of gas; similar work in schools, etc.

Women's organizations and special work, other than home service educational work:

(a) Officials.
(b) Employees.
(c) Customers.
(d) Public.
(e) Students, including general instruction as to public service and courses for those who intend to take up utility work.

How to make the work of the State Committees on Public Utility Information more effective and more related to the gas industry.

Publicity on the wonderful achievements of gas.

House piping—extent in houses, etc., and how to be accomplished, through literature, architects, etc.

General discussion of Subject 4 by A. B. Macbeth, Southern Counties Gas Co., Los Angeles, Cal., and A. B. Day, Los Angeles Gas & Electric Corp., Los Angeles, Cal.

Section D by M. C. Robbins, Robbins Publishing Co., New York, N. Y.

Section E by W. Griffin Gribbel, John J. Griffin & Co., Philadelphia, Pa.

Home service by J. P. Hanlan, Public Service Electric & Gas Co., Newark, N. J.

(Continued on page 38)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 53

Change of State *(continued)*

Specific Heats of Gas Tabulated

The following tabulation gives the specific heats of a number of gases, both when the pressure and the volume remain constant:

	Constant volume	Constant pressure
Air	0.1688	0.2375
Acetylene	....	0.3730
Ammonia	0.4011	0.5202
Benzene vapor	0.2131	0.2990
Carbon disulphide	....	0.2088
Carbon dioxide	0.1558	0.2025
Carbon monoxide	0.1734	0.2425
Ethylene	0.3404	0.4040
Ethylene chloride	....	0.2030
Hydrochloric acid gas	....	0.6000
Hydrogen	2.4219	3.410
Hydrogen sulphide	....	0.2432
Methane	0.4505	0.5929
Nitrogen	0.1715	0.2419
Oxygen	0.1603	0.2240
Sulphur dioxide	0.1246	0.1553
Water vapor at 100 degrees C	....	0.453

Specific Heat of a Mixture of Gases

In practical work gases are often met with in admixture. Thus coal gas is a mixture containing carbon monoxide, carbon dioxide, hydrogen, methane, ethylene and small quantities of other gases. Water gas contains nitrogen, carbon monoxide, hydrogen, etc. The gases obtained by combustion generally contain carbon dioxide, water vapor, a little carbon monoxide and nitrogen. The next question to be considered is the determination of the specific heat of gaseous mixtures.

The general rule to follow is to multiply the specific heat of each individual gas by its percentage by weight in the mixture and to divide the sum of the products by 100. An example is given below of such a calculation.

Example of Calculation

For example, take the case of a high B.t.u. water gas, which has the following composition:

Hydrogen	52.76 per cent.
Carbon monoxide	35.88 per cent.
Methane	4.11 per cent.
Carbon dioxide	2.05 per cent.
Nitrogen	4.33 per cent.
Total	99.13 per cent.

In this case the total analysis of the gas does not equal 100 per cent, and consequently the individual specific heats are multiplied by the percentages given above and divided by 99.13 in place of 100.

The specific heats of the gases can be found from the table given above and then the calculation assumes the following form:

Hydrogen	3.410 × 52.76
Carbon monoxide	0.2425 × 35.88
Methane	0.5929 × 4.11
Carbon dioxide	0.2025 × 2.05
Nitrogen	0.2419 × 4.33
Total	

This figure, divided by 99.13, gives the specific heat of the water gas as

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HEATING METHODS ADVANCE SHOWN BY GAS FIGURES

State-wide increase in the use of manufactured gas for industrial and household uses in Illinois is shown in comparative statistics just made public by the Illinois Commerce Commission.

A total of 41,249,575,716 cubic feet of gas was sold in 1923, as compared with 38,214,712,997 cubic feet in 1922, the figures show. The three billion cubic feet increase, amounting to 7.88 per cent, was due largely to increased use by industries, although households also show a substantial gain. There was an increase in customers of 42,818, or 3.96 per cent, while the gain in population of areas served by the companies was but 0.15 per cent.

More uses for manufactured gas and a more intensive application of it, is indicated by the increase of 3.13 customers per mile of mains, and by the ratio of customers to population. In 1922 there was one customer to each 4.1 persons and in 1923 there was a customer to each 3.9 persons. Consumers of gas, in 1923, used, on an average, 1,354 cubic feet more gas than in 1922, the figures show. During the year 329.6 miles of additional gas mains were laid—more than enough to extend from Chicago to Columbus, O.

Some Fine Points In Salesmanship

Important essentials of successful selling applicable to the gas salesman

Bruce F. Richards

THE salesman who is unusually successful is the one who disciplines himself to the point of having very few shortcomings. He realizes that every shortcoming, no matter how small, is negative in effect, and that several shortcomings may in the aggregate be sufficiently cumulative in extent more than to offset the positive efforts exerted. This makes it very plain, that a salesman who expects to make a fine record and to be sure of himself must continually cultivate the fine points of methods and manner in his business transactions.

Here are a few of these fine points which are not often recognized. They lie just a little beneath the surface and so escape the attention of the superficial observer. The list we are offering at this time might be classed as "shortcomings," and because of their negative character they are a menace.

Notice that many of these shortcomings represent excellent qualities which have been carried too far, or exaggerated—while some of them represent positive qualities which do not go quite far enough.

When to Start and Where to Stop

In considering these shortcomings, as well as the positive or right methods in salesmanship, we must remember first of all to use the best of good judgment in knowing how far to go, when to start and where to stop.

Enthusiasm is a good thing. Too little is dangerous, as we cannot impart to others an interest or confidence which we ourselves do not possess. Too much enthusiasm is equally to be feared. The prospect becomes suspicious, especially if the salesman over-urges, or exaggerates, or by his enthusiasm creates the impression of being too partison or possibly unreasonable in his claims and contentions.

Be careful to strike the right pitch of enthusiasm.

The Value of Tact

Tact is a very necessary quality of salesmanship. Too little of it is to be deplored. The salesman who lacks tact is likely to blunder and to say and do the wrong thing, so as to give offense or to arouse sales resistance, possibly antagonism.

But it is possible to have too much tact, and to be servile, fawning and condescending. This always prejudices.

Be careful to strike the right pitch of tact.

Concentrated Effort

Concentration on the matter in hand is necessary, so as not to let the prospect wander in interest, or draw you, the salesman, aside from the main line of your selling effort. But beware lest concentration becomes abstraction. Many a salesman has grown so intensely earnest in following up his own arguments and play that he has failed to discern the exact psychological moment when the sale could have been clinched. Too little concentration, especially in handling the prospect who is inclined to introduce outside issues or the one who is sure he knows what he wants, is a short-coming, as the salesman is sure to be led away and overcome, as it were, by what the other fellow has to offer.

Be careful to strike the right pitch of concentration.

Credulity

Credulity is a factor in skillful selling. We must assume that the prospect has use for and need for what we are offering. We must assume that he is able to pay the bill. We must assume that he can handle and use our offering intelligently. To fail or fall short in any of these assumptions is to kill our own selling enthusiasm and to belittle and offend the prospect himself.

To attempt to force an immediate decision when the prospect speaks of wanting more time is poor policy. It looks as if we are afraid of further investigation, or we doubt what the prospect says, and as if we think he is trying to get away from us. The negative selling action we take reflects these fears and the prospect feels the inevitable reaction. Naturally, he is off the mood of buying in a minute. Show credulity or belief in the prospect's good faith. But over-credulity is to be deplored. Unless we are posted to a reasonable extent we are likely to waste time and effort trying to sell to people who have no reason for being interested or who have not the money to pay. And when the prospect stalls for more time we may fail to fix an appointment or to make definite arrangement to take the matter up again at his convenience. And so over-credulity defeats all we have tried to do.

Be careful to strike the right degree of credulity.

Confidence

Confidence is one of the main ingredients of successful selling. We just have confidence in what we are offering. We must have confidence in our own ability to present the matter. We must have con-

(Continued on page 38)

Catechism of Central Station Gas Engineering in the United States

Installment No. 53.

(Continued from last week)

Ans. The person investigating a complaint of a leak of gas should, after reaching the house and making known his identity and errand, obtain from the occupants all the information possible as to the size and location of the leak. If they can give definite information it can be acted upon, but failing such information a thorough examination of all the fixtures and piping will be required.

When the leak is noticeable in one room only, the keys of the fixtures in that room should be examined to see that all are shut off and that there are no leaks around them. Finding the keys tight, the joints between different parts of the fixtures and between these and the pipe outlets should next be investigated. In every case the examination should be made by smelling at the suspected points, or, in case the sense of smell is deficient, by means of soapy water. In no case should a light be used, as it is dangerous. Moreover, even very small leaks can be located by smelling or by soapy water more quickly and accurately than by the use of a light. Never strike a match or attempt to light a leak after it has been found.

Details of Locating the Leak

Where the smell of gas is noticeable more or less all over any one floor, the leak cannot be above this floor and should be sought below it. In such a case it is well to start the search in the cellar, examining the end of the service, the meter and its connections and all exposed piping, and, failing to find in any of these a leak sufficient to produce the smell noticed, the points at which the water pipe and sewer enter the cellar, and also any open joints in the masonry of the walls through which gas might be coming in from a leak outside the house. If gas is found to be coming in from outside, steps should be at once taken to have the leak located and stopped. The nearest telephone should be used for communicating with the office, if necessary. If no clue is found in the cellar, the examination should be continued on the floors above until the leak is found or until all the fixtures and exposed pipes have been gone over. If the leak cannot be located on the premises, investigations should be made of the adjoining properties and the search continued until the leak is found.

When no leak can be located in the exposed work, its location in the concealed piping can often be closely approximated by smelling at the openings around sliding doors and along the baseboards.

Having located the leak, if it is inside the house, it is well to determine the rate of leakage by means of the test hand on the meter, it having been made certain that no gas is being used at the time. This done, the leak, if it can be gotten at and is such that it cannot be immediately repaired permanently, should be stopped temporarily with soap. If it is around the service, meter or meter connections, the consumer should be told that it has been stopped temporarily and that the company will have it fixed permanently as soon as possible. This should be done for a leak in a fixture or in exposed house-piping when the gas company does such work, otherwise the consumer should be told that it is necessary for him to have a gas-fitter attend to it.

When the Leak Cannot Be Located

If the leak is in the house and is bad but cannot be located, or if located cannot be gotten at, the gas should be shut off at the curb cock, when there is one, or else at the meter. The fact that the gas has been shut off should be at once communicated to the office, using telephone if necessary, so that an official letter can be sent to the consumer explaining why the gas is off and what the consumer must do to get the gas turned on again. If the leak is outside the house and is bad, the cellar windows, and if necessary the first floor windows as well, should be opened for ventilation and the consumer instructed to keep them open and avoid the use of lights until the leak has been found and repaired. When the leak is small the gas need not be shut off in case of inability to locate and repair it, but the consumer should be instructed to get a gas-fitter to attend to it or told that the company will take further steps to stop it, as the case may be. Such steps would probably include the use of an air pump and ether to locate the leak, and the opening of the floor or wall to afford access to it.

If, on calling to investigate a leak, it is found impossible to gain access to the premises and there is an odor of gas coming from the keyholes, window joints, etc., the gas should be immediately turned off at the curb cock, if there is one, and, if the house is apparently occupied, the police authorities notified. If unoccupied, access should be gained to the premises by securing the keys from the custodian. In either case, the office should be notified at once, by telephone.

If a leak is found to be dangerously bad, street help should be secured at once from the office. The occupants of all the premises in which the gas may be finding its way should be notified, and the houses ventilated.

If, when answering a complaint, a careful search reveals no leak, the occupants should be questioned further. Occasionally the statement is made that

the odor of gas is noticed at a particular time of day, or during a certain condition of the weather. An appointment should be made to call at such a time in order that the consumer may be completely satisfied.

When an escape of gas has caused sickness, or an explosion or fire has occurred, the office should be notified at once, by telephone.

Handling a Large Bill Complaint

284. A consumer who has received an unusually large bill for gas consumed during the preceding month complains that it is not correct. Assume that it is your duty to investigate the complaint and tell how you would handle the job.

Ans. The first step in the investigation of a complaint of an unusually large bill for gas should be to check the work done in making out the bill to see that no mistake has been made either in copying the meter readings or in calculating the amount of money from the quantity of gas. Finding everything correct in this respect, the reported meter reading should be verified by at once reading the meter again and comparing the rate of consumption indicated by the difference between this reading and the last one on the bill in question with the rate shown on the bill.

If no error appears here, the question whether the consumption complained of was unusually large should be settled by examining the record of the previous bills of the same consumer in the same location for the preceding two years, or if the consumer is a new one, or has recently moved to his present location, the bills of the former consumer in the same house and those of the complaining customer in his former residence should be looked up. If this examination shows that the bill is little, if any, larger than would be expected from the record of previous years this record should be shown to the consumer and an attempt made to persuade him that the bill was not an abnormal one. In making the comparison of the present and former bills, the bills for the month next preceding that in question should also be included, in order to ascertain whether or not through an under reading of the meter at the end of the preceding month the bill for the month had been made small at the expense of that for the month in question. If the examination showed that it was unusually large, or the consumer could not be convinced that it was not, an endeavor should be made to find out either by questioning the consumer or members of his family, or by investigation in other directions, whether there was not some good reason, such as the installation of some new gas appliances, the presence of guests in the house for a week or two, the giving of a reception or other entertainment, or the occurrence of sickness in the family, which explained why more gas than usual should have been burned that month. If care is not taken to have each meter read as nearly as possible on the same date each month, and the date on which each statement is taken is not given on the bills and on the records, it should be made certain that the bill in question did not cover an unusually long period of time. If any reasons for an abnormal bill are brought to light in this way they should be reported to the consumer and an endeavor made to satisfy him that the bill was correct.

Details of the Investigation

If no reasons are found, the person investigating should try to form an opinion of his own as to whether the bill was an unreasonable one for the house by an examination of the number and character of the burners and gas appliances that are used. Failing to discover in these ways any cause for an extra consumption of gas, the meter should be removed and tested. If the test shows the meter to be correct, or so little in error as not to account for the extra size of the bill, the pressures at the house should be investigated in connection with the character of the burners and appliances used, and if the burners and other appliances are not adapted to burn gas economically under the existing pressures, an offer should be made to the consumer to substitute new burners, and to adjust the other gas-consuming appliances to suit the existing pressures.

In the event of not discovering any reason for an abnormal bill either in the meter, which should be very carefully examined as to the condition of its gearing, diaphragms, etc., if there be the slightest doubt that the prover test does not indicate the true condition of affairs, or in the condition existing at the house, the payment of the bill should be insisted upon, unless it is thought that its size was so unreasonable from the consumer's standpoint that it would be bad policy to force its entire payment. In such a case a certain portion should be remitted.

In all dealings with the consumer during the investigation he should be treated in such a way as to make him feel that it was thought that he was sincere and might have some reason for his complaint, without committing the gas company to the acknowledgment that there was any error until the matter had been investigated.

A Complaint Meter

285. Give a description of a "Complaint Meter," and state the purposes for which it is useful.

Ans. A "Complaint Meter" is a meter which will record the time and the rate of speed at which gas passes through it, and is essentially an ordinary dry meter equipped with a mechanism for making such a record.

This mechanism is placed in a box built of tin on top of the regular meter case and provided with a hinged cover. It consists of a cylinder caused to revolve by clockwork and a pen point so placed as to make a continuous line upon a record sheet wrapped around the cylinder.

(Fifty-fourth Installment Next Week)

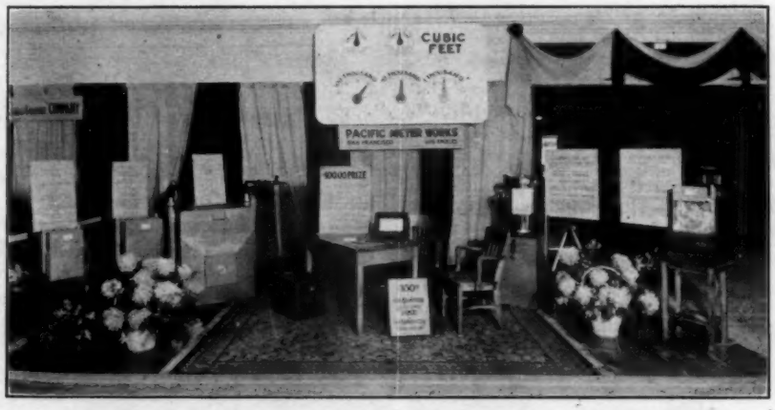
Gas at an Industrial Exposition

A demonstrator operated th emechanism, turning the dials into any position desired for the reading of the index.

Wording under the leak dial and the proving head dial explained what these two dials were for.

Sectional Meter

There was also placed on exhibition at this booth a specially made sectional meter which permitted visitors to see exactly how a meter worked. At the



Booth of Pacific Meter Works at California Industries Exhibit

The Standard Test Booth

Included in the exhibit was a cubic foot bottle standardized by the Bureau of Standards at Washington, D. C. This was used to impress the public with the fact that the bottle used by the State Railroad Commission in checking apparatus at the various gas companies. This bottle was borrowed from the Railroad Commission. At the side of the bottle was placed an appropriate card telling the public just what it was used for.

side was a card describing the various features by means of a code of numbers. The various parts of the meter were numbered so that the visitor could look for any number on the card and read a description of the part represented thereby. The sectional meter was driven by an electric motor by extending the meter crank down through the partition and the bottom of the meter.

TRAINED EMPLOYEES FOR PUBLIC UTILITY SERVICE

(Continued from page 24)

and momentarily; it may affect the singer permanently. But an irritating defect in the voice or utterance of the former may produce a public effect which will wreck all other efforts of the utility to compass that priceless asset—public good will.

Utilities Themselves Must Set the Standard

The inspiring of our utilities themselves, in their corporate entity, to seek the highest standards of personal service, is as important as the training of individual employees. A stream cannot rise above its source, and it is doubtful if any employee group can rise very much higher than the ideals for which the corporation itself stands. Nor can too much emphasis be placed upon having constructive conditions prevail within the organization in our utility's attitude toward its own employee relations. Indifference in the matter of employee welfare and relationships will inevitably lead to a personal reaction which is bound to carry a most undesirable influence through the company. A sense of injustice within the organization will carry through and have a most undesirable effect upon the public outside, whose good opinion and favorable attitude are so essential to any public service corporation.

Special Department to Direct Human Relationships

We are undoubtedly beginning to appreciate the importance of this matter from the standpoint of our public relations and are tending to place this field of human relationship under the direction of competent, specially trained men with a broad comprehension of the demands of modern social and industrial life. We are realizing that the high degree of service we are expected to render, and must render, cannot be attained through representatives who serve without ideals or are inadequately trained, any more than it can be expected from those who are given the opportunity to live and work under conditions which lead to better personal development and the attainment of that degree of self-respect and position in the community to which everyone is entitled, in a relative sense, who serves well and faithfully. Only through competent agencies can our ideals and policies, our efforts and responsibilities be successfully realized in the public service.

SOME FINE POINTS IN SALESMANSHIP

(Continued from page 34)

fidence in our knowledge of what we are selling and of the person to whom we are selling.

If we have too little confidence we will be discouraged too soon. We will not know when to swing from one selling argument to another and we will accept defeat before we have met it. Under-confidence is timidity and lack of knowing exactly when we have suffered a temporary setback or a real failure.

Over-confidence loses an enormous amount of business. The salesman who is over-confident fails to apply the necessary methods of sustained, dynamic selling action. He stops his strong tactics too soon because he is confident that he has made the sale. He takes too much for granted and lacks tactful tenacity. Over-confidence is equally dangerous and almost parallel in effect with under-confidence.

Be careful to strike the right degree of satisfaction.

Time

Time is one of our most valuable possessions. It is natural for all of us to like to spend time agreeably. It is more difficult to handle prospects and new customers than those whom we have learned to know. So there is a temptation to spend too little time with some customers and too much with others. We must use good judgment in knowing how much time to give to each person and not defraud some by giving them too little and permit others to encroach upon our time-capital by talking too much.

Be careful to strike the right measure of time.

Courage

Courage is one of the strong strands in the cable of salesmanship. If our courage is too little we will not undertake what we should. If our courage is too much, or overgrown and a bit mis-shapen, we are liable to be led into action which will be interpreted by the prospect as over-familiar and lacking in a sense of the fitness of things.

If we lack courage or good judgment in the use of courage, we will be very likely to fail to recognize the psychological moment when certain selling arguments will make a ten strike, or the moment when the sale should be closed, either tactfully or with a snap. Once that moment is past, it is all but impossible to recall it.

Be careful to strike the right quality of courage.

Seven delicate points having to do with the artistic and successful development of salesmanship are enough to consider at one time. In order to make the most of these and to make them count in our business relations we should study them one by one and observe analytically how these very points or methods or qualities are handled by the most successful salesmen we know. We have enough material here for exercise and practice for some time. If we persist in mastering these seven points we shall overcome dangerous, negative shortcomings, and that means a double increase of salesmanship ability on the right side of the ledger.

PROGRAM OF MID-WINTER GAS CONFERENCE

(Continued from page 32)

House piping, by J. E. Davies, Peoples Gas Light & Coke Co., Chicago, Ill.

5. Customer and Employee Ownership of Stock

Leader, Charles A. Munroe, the Laclede Gas Light Co., St. Louis, Mo.

6. How Can One or More Large Appliance and Apparatus Concerns, in the Same Relation to the Gas Industry as Those in Other Industries, Assist the Gas Industry More Than the Present Method, and How Can Such a Problem Be Accomplished if Found Advantageous?

Leaders, John S. De Hart, Jr., Isbell-Porter Co., Newark, N. J., and C. J. Ramsburg, the Koppers Co., Pittsburgh, Pa.

7. Geographic Divisions

Study of geographic divisions and probable necessity of increasing the revenue if there should be a division of activities.

Leaders L. R. Dutton Suburban Gas & Electric Co., Jenkintown, Pa., and E. L. Hall, president, Pacific Coast Gas Association, Portland, Ore.

8. New Developments

Unreported developments either within or without our industry which have important bearing on the industry, or other developments previously reported but not fully discussed.

9. Safety

Discussion of causes for deaths attributed to asphyxiation by gas and how they may be lessened.

Report on testing laboratory.

Leader, O. H. Fogg, Consolidated Gas Co. of New York, New York, N. Y.

10. Theft of Gas, Study of Laws, Recommendations to Have Laws Passed Which Are Enforceable

Leader, H. B. Flowers, New Orleans Public Service Corporation, New Orleans, La.

11. Standardization of Consumers' Meters

Brief statement by Donald McDonald, American Meter Co., New York, N. Y.

12. Statistics and Their Importance to the Industry

Leader, W. A. Sauer, the Peoples Gas Light & Coke Co., Chicago, Ill.

13. High Pressure Distribution or What Pressure Is Best Under Average Conditions

Leaders, R. S. Fuller, Pacific Gas & Electric Co., San Francisco, Cal., and R. M. McCalley, Portland, Ore.

14. Company Group Insurance

Short paper by J. C. Reese, Baltimore, Md.

Discussion by H. B. Flowers, New Orleans, La.

15. Use of Recording Calorimeter

Short paper by W. A. Dunkley, Memphis, Tenn.

GASIFICATION OF LOW GRADE FUELS

(Continued from page 26)

the process is also advantageous from the standpoint of the recovery of by-products. The conditions which tend towards the maximum yield of ammonium sulphate are thus fulfilled in this type of apparatus, as well as those which control the attainment of a tar of good qualities as another by-product of gasification.

Capacities of Generators

The generators of this type are made with or without mechanical ash removal devices, and are able to gasify 3,000 to 14,000 kilograms of fuel in twenty-four hours. The space occupied by the apparatus is small and there is no power required to operate it.

Operating Results

The following operating results are interesting. In a period of twenty-four hours, 11,520 kilograms of lignite coal were gasified which possessed an average heating value of 4,271 heat units per kilogram, a water content of 29.3 per cent and an ash content of 5.95 per cent. There was, therefore, consumed 11,520 × 4,271, or 49,201,920 heat units. In addition thereto must be added the heat that is introduced in the form of steam for sucking into the generator the air that is required for combustion purposes. The steam consumption in this case amounted to 1,500 kilograms in twenty-four hours at a pressure of four and a half atmospheres. The heat content of this steam was 659.2 calories per kilogram. The total amount of heat that is contained in this steam is, therefore, 1,500 × 659.2, or 988,800 calories. Hence the total consumption of heat in the operation in the form of steam and combustible is 49,201,920 plus 988,800, or 50,190,720. In the period of twenty-four hours there was produced a total of 28,146.5 cubic meters of generator gas, which means 2.42 cubic meters per kilogram, with an average heating value of 1,510 heat units per cubic meter. The heating value of the gas was found by taking hourly samples for analysis and determining its calorific power in the usual manner. The total production of heat is therefore 28,146.5 × 1,510, or 42,501,215 heat units. Hence the efficiency of the gasification process may be found by dividing the heat output, 42,501,215, by the heat input, 50,190,720, which gives 84.68 per cent efficiency.

Use of Apparatus With Bituminous Shale

An interesting substance from the standpoint of gasification is bituminous shale. This is a product which is found in various countries and which contains as high as 35 to 50 per cent ash. It is a very low grade fuel, indeed. The composition of an average bituminous shale is given below:

Carbon	47.65	31.95
Hydrogen	3.46	2.80
Oxygen	13.32	12.64
Nitrogen	0.70	0.59
Sulphur	0.79	0.86
Ash	34.08	51.17
	100.00	100.00

The thermal value of this substance is very low, but that of the gas which is derived from it is rather high. This clearly indicates the value of the gasification process. In fact, the chief advantage of gasification is that it turns a fuel of low thermal value into one of high thermal value. The thermal value of the bituminous shale is 4,660 heat units per kilogram in the one case and 3,252 heat units per kilogram in the second case. These figures are obtained by testing the dry fuel in a calorimeter. The composition of the gas that is obtained from this fuel is as follows:

Carbon dioxide	8.8 per cent
Carbon monoxide	20.3 per cent
Methane	6.9 per cent
Hydrogen	22.0 per cent
Oxygen	0.2 per cent
Nitrogen	42.6 per cent

The heat value of this gas is 1,791 heat units per cubic meter. The loss on ignition of the ash, representing combustible matter contained, is 4.15 per cent.

The Formation of Tar

In the gasification of a combustible matter for the production of gas it is always advisable to obtain a coal tar as a by-product, if this is possible. This tar has greater value than that which is ordinarily obtained in the gasification of brown coal. It has been established that when the motion of the gases that are produced in a generator is in the inverse direction to that of the fuel itself, then the generator is being operated under conditions which are advantageous for the production of a tar of first quality. The reason for this is that once the tar is formed it is not subjected to high temperatures which tend to decompose its constituents with the formation of carbonaceous deposits within the tar mass, which lowers the value of the tar for the various purposes to which it is put. Care is therefore to be taken to see that the gasification of the combustible matter in the generator is carried out at as low a temperature as possible, so that only completely degasified coke reaches the gasification zone. When a generator is operated at such low temperatures as in the present case there need be no fear that the quality of the tar produced will not be good.

Furthermore, it has been found that when the cross-sectional area of the gasification chamber of a generator is made to decrease progressively from the top to the bottom, the speed of travel of the carbonaceous fuel through the drying and gasification zones is small. Because of this slow travel of the fuel, its complete degasification takes place before it enters the gasification zone. In other words, the volatile matter that is contained in the fuel is

driven out before it attains the zone in which the fixed carbon of the fuel is changed into gas. Because of the small cross-sectional area of the gasification zone in such generators, the speed of the process is rapid, but not too rapid that complete gasification does not result.

Results Obtained from Apparatus in Recovering Tarry Matters

A number of practical results were recorded as being obtained from this type of apparatus as far as the recovery of tar was concerned. These results are interesting and are given below. In this case a lignite coal which was rich in bituminous matter was used. The lignite fuel was found to contain 37.20 per cent of moisture, 6.07 per cent of ash and 56.73 per cent of pure carbon.

The yield of high grade coal tar was found to be from 18.2 to 19.8 per cent. It was found to contain 24 per cent of phenols and about 7 per cent of paraffine. When a benzol extraction was made of a sample of coal, it was found to contain 5.73 per cent of bitumens. There was a certain amount of waxy matter present in the coal, in addition to a considerable amount of resinous matter.

The amount of tar in the gases that were evolved from the generator was determined by the Jencker method and it was found that in every cubic meter of the gas there was present about 121 grams of tar. Inasmuch as the yield of gas from this coal was found to be 1.40 cubic meters (reduced to standard conditions of temperature and pressure) per kilogram of coal during the gasification process. This indicates a recovery of more than 90 per cent of the quantity of tarry matters that a preliminary analysis showed might be recovered from the coal.

Analysis of the Tar

An analysis was made of the tar and the following results were obtained:

Asphalt matters	8.3%
(Softening point 61 deg. C.)	
Phenols	23.5%
Non-viscous neutral oils	26.1%
Viscous lubricating oils	29.3%
Crude paraffine	7.2%
(Softening point 40 deg. C.)	
Resinous matters	3.1%

Another Test of Tar Recovery

Another test was made with a lignite coal which was comparatively free from bitumens. The analysis of the coal was found to be 34.31 per cent of water, 10.31 per cent of ash and 55.38 per cent of pure coal. The tar yield was from 7.3 to 8.2 per cent. This tar was found to contain 19.5 per cent of phenols. The gas which was derived from the generating apparatus and whose temperature varied between 69 and 75 degrees C, according to the load conditions within the generator, contained on the average 54 grams of tar per cubic meter. Inasmuch as the yield of gas was 1.25 cubic meters per kilogram of coal, there were then obtained from one kilogram of the fuel approximately 73 grams of tar. This again indicated a recovery of more than 90 per cent on the estimated amount of tarry matters that a preliminary analysis showed to exist in the original fuel and that might be recovered.

It has been found that when a comparison is made of the composition of the tarry matters recovered as above with that of the tarry materials recovered in the Mond gas process, both tars appear to be of the same quality. The consumption of steam in the Mond gas process is about 60 per cent of the weight of the coal that is fed into the generating apparatus. This is figured on the basis that the coal contained 34 per cent of water. The same coal when gasified in the type of apparatus, which is described herein, was found to consume only 20 per cent of steam. This means a correspondingly greater conversion of carbonaceous matter in the generator and also an increased boiler capacity.

GAS INDUSTRY EXPANDS AT RAPID RATE

H. C. Abell, president of the American Gas Association, commented as follows on the business outlook of the gas industry for 1925:

"The manufactured gas industry is now on a more stable basis than it has ever been. Public regulation is fairer, more intelligent and more responsive to the real needs of the public than ever before. Increased confidence in the principle of private management under truly public ownership promises to be one of the outstanding developments of 1925.

"The per capita use of gas shows a steady increase owing both to industrial installations and greater domestic use. This has been brought about largely by intensive and well directed publicity designed to tell the public of the many ways in which gas manufactured under improved processes and utilized through efficient appliances has become a vital factor in domestic comfort and manufacturing economy.

"One executive of a Middle West company which operates in fifteen states says that business during the next eighteen months will be so good that it will entirely digest all expansion programs made during the last three years. Another executive in the Rocky Mountain district predicts that the next five years hold more for the industry than the past twenty. On the Pacific Coast the gas business is growing at a faster ratio than the population. Reports from the East and South are equally encouraging.

"Persistent public accumulation of the securities of public service companies is a splendid augury of the new era of understanding existing between the producers and users of these essential services. This is largely a reflection of the rapidly growing appreciation of the efficiency and integrity of the managements and the sound financial structure of the organizations behind them."

Current Market Prices

COALS (By Courtesy of Coal Age)

A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64 (Gas Standard)	New York	$1.40 to $1.65
Pittsburgh screened gas	Pittsburgh	2.30 to 2.50
Pittsburgh gas, mine run	Pittsburgh	2.00 to 2.25
Kanawha lump	Columbus	2.10 to 2.50
Kanawha mine run	Columbus	1.45 to 1.65
West Virginia lump	Cincinnati	2.00 to 2.50
W. Virginia gas mine run	Cincinnati	1.00 to 1.50
Midwest		
Indiana 4th vein lump	Chicago	3.25 to 3.50
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	2.50 to 3.25
Big Seam mine run	Birmingham	1.50 to 1.90
Southeast Kentucky lump	Louisville	2.35 to 2.65
Southeast Kentucky mine run	Louisville	1.25 to 1.75

B. Anthracite.

(Spot prices F. O. B. mines, gross tons),

	Market	Freight rates	Independent	Company
Egg	New York	$2.34	$8.50 to $8.75	$8.75 to $9.25
Egg	Philadelphia	2.39	9.45 to 9.75	8.80 to 9.25
Egg	Chicago (net tons)	5.06	8.17 to 8.40	8.08

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$4.25 to $5.00
Wise County, furnace	4.00 to 4.25
Alabama, furnace	4.00 to 4.50
Foundry, Newark, N. J., del.	10.41
Foundry, Chicago, ovens	10.75
Foundry, Boston, delivered	11.50
Foundry, St. Louis	11.00
Foundry, Granite City, Ill.	9.00
Foundry, Alabama	4.50 to 5.25

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	1.45
Corning, Ohio	1.50
Lima	1.58
Pennsylvania	$3.00 to 3.10
Wooster, Ohio	1.40
Indiana—Illinois.	
Illinois	1.37
Indiana	1.38
Oklahoma—Kansas.	
Mid-continent (low gravity)	.75
Gulf Coast.	
Gulf Coast, Grade A	$1.50
Gulf Coast, Grade B	1.25

GAS OILS.

Gas Oil, Bayonne, bulk gal.	5¼c
Gas Oil (32-36) Oklahoma, gal.	3½ to 3¾c
Gas Oil (32-36) Gulf Coast, gal	3¾ to 4 c

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$57.20
Six-inch and over, Chicago	53.20
Four-inch, Birmingham	$49.00 to 50.00
Six-inch and over, Birmingham	45.00 to 46.00
Four-inch, New York	65.50 to 66.50
Six-inch and over, New York	60.50 to 61.50
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20

BY-PRODUCTS

(By Courtesy of Oil, Paint and Drug

Ammonia aqua, 16 deg. drums lb.	5 to 5¼c
Ammonia aqua, 20 deg. drums lb.	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb.	6½ to 7 c
Ammonia squa, anhydrous cylinder, lb.	30 to 36 c
Ammonium sulphate, bulk F. O B. Works, per 100 lbs.	$2.75 to $2.80
Potash prussiate, yellow casks, lb.	18 to 19c
Potash prussiate, red casks, lb	38 to 39c
Soda prussiate, yellow casks,	9¾ to 10c
Soda sulphocyanide, barrels, lb.	45 to 55 c

COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

Benzol C. P. tanks, works, gal.	24 to 25c
Benzol, drums, gal.	30c
Benzol, 90% tanks, works, gal.	23c
Benzol, 90% drums, gal.	28c
Napthalene, flake, barrels, lb.	5½ to 6 c
Napthalene, dyestuff bags, lb.	5 to 5½c
Solvent Naphtha, water white works, gal.	24 to 25c
Solvent Naphtha, drums, works, gal.	29 to 30c
Toluene, C. P. tanks, works, gal.	31c
Toluene C. P. drums, works, gal.	36c

Coal

As is usual during Christmas week, there was a pronounced falling off in the production of bituminous coal during the week ended December 27, figures by the Geological Survey indicating an output of 7,638,000 net tons.

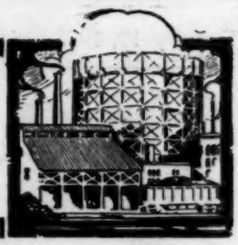
Soft coal output in 1924, according to the preliminary estimate of the Geological Survey, was 467,700,000 net tons, though the Survey adds that final figures usually show the preliminary total to be from 2 to 3 per cent too low, which would indicate that the total may be as high as 480,000,000 tons. This is a decrease of nearly 100,000,000 tons from the 1923 total, when 564,157,000 net tons was produced.

Anthracite production for last year up to December 27 was 89,320,000 net tons, compared with 93,020,000 tons in the corresponding period of the previous year.

Crude Oil

Despite heavy production in the Wortham pool in Texas, the daily average of domestic crude oil output in the week ended December 27 fell off 23,250 barrels, the decline resulting from the cold wave which swept the country. Production for the week, according to the American Petroleum Institute, averaged 1,963,150 barrels a day, as compared with 1,986,400 barrels for the preceding week. The daily average production east of California was 1,353,650 barrels, a decrease of 22,250 barrels.

NEWS OF THE GAS INDUSTRY



Michigan Gas Companies Plan 1925 Improvements

Ann Arbor, Mich.—More than $45,000,000, or almost $4,000,000 a month, was spent by the gas and electric companies of Michigan during 1924 to expand their facilities for service in order to meet the demands of the people throughout the state, according to the Michigan Public Utility Information Bureau here.

According to present indications, based on incomplete reports, the construction program for 1925 will be as large, if not greater. During the year just ended 90,000 new families and business consumers were added by all companies.

Third on the list of those who are continuing to build as rapidly as conditions permit in order to keep pace with demand for service is the Detroit City Gas Company. During 1924 it added to its plant a total of $4,500,000 and took on 20,000 new customers. While the 1925 construction program is still under consideration, it is stated that the projects under advisement are considerably greater than for 1924. The company expects to serve 25,000 additional consumers next year and lay 125 miles of mains.

Lansing reflects healthy growth in the expansion of its gas service. The Lansing Fuel and Gas Company reports that it spent $275,000 for extensions in 1924 and that 1,075 new consumers were added. Next year it is contemplated to build additions to the coal gas plant and to the system of mains.

The Mt. Clemens Gas Company plans to start in 1925 its $500,000 expansion program, which is expected to cover two years' work, and which will, when complete, extend gas service to outlying townships and villages.

Ann Arbor is also thriving, according to gas service figures. During 1924, the Washtenaw Company spent $50,000 for new services, mains and plant additions. Five and one-half miles of mains were laid and 254 new customers added. The 1925 program calls for about the same amount of extension.

The Alpena Gas Company remodeled its plant and expanded its distribution system in 1924, making expenditures of $30,000. This included a "water gas" machine with a capacity of 200,000 cubic feet of gas a day as production capacity. Several improvements to the plant are contemplated for 1925.

Charlotte is to be served with a new gas holder of 150,000 cubic feet capacity.

The Ludington Gas Company rebuilt its plant in 1924 and installed new equipment, representing an expenditure of $11,000, also adding 78 new customers.

New Gas Plant at Harrison, N. J.

The Public Service Production Company, a subsidiary of the Public Service Electric and Gas Company, has placed a contract with the U. G. I. Contracting Company for the erection of a plant at Harrison, N. J. The apparatus and machinery will include:

Eight 11 in. diameter U. G. I. cone top, hopper bottom, carburetted water gas sets, with all modern improvements, such as hydraulic operation, exhaust steam connections, hinge grates, special interlocked cleaning doors.

Each set will be equipped with back-run connection.

Eight 7 ft. 6 in. diameter vertical waste heat boilers, to generate steam for use in this plant.

Each water gas set will be equipped with a U. G. I. Model "B" automatic control and upon the installation of these controls the Public Service Company will have installed a total of thirty U. G. I. automatic controls throughout its system.

In the new generator house there will be installed two (2) U. G. I. barring down machines for use with the eight water gas sets.

This plant will have a daily capacity of 38,500,000 cu. ft. of carburetted water gas, and the plant will be located on the Jersey meadows along the Passaic River, across from Newark.

The preparation of the site involves many problems of construction, such as piling, dredging and dock building; likewise a gas main will have to be run beneath the river. All this work will be of such a character that is not ordinarily encountered in the building of a gas works.

Record Gas Production in Bridgeton, N. J.

The Bridgeton Gas Light Company has just reported the greatest distribution of gas for any week in the 67 years this company has been manufacturing. Manager Jacob B. Jones was asked to account for the record having been broken just at this particular time and he replied that it was the growth of the all-gas kitchen with Christmas dinners in preparation together with the use of gas for illumination in the business district.

He felt very proud of the new record and gave the praise to his loyal organization, which never lets trouble get cold before they are after it.

A. G. A. Committee Meeting in January

The following committee meeting of the American Gas Association has been scheduled for January:

Home Service Committee of the Commercial Section, Association Headquarters, January 15.

Business of the Public Service Gas Co. of Colorado During 1924

The Public Service Company of Colorado during 1924 secured 14,000 customer stockholders, employed 2,198 persons and had a payroll of $3,160,000. During the twelve months it served 64.822 with gas, disposing of 2,806,790,000 cubic feet of gas.

County Gas Company Spending $175,000 for Improvements

Atlantic Highlands, N. J.—The County Gas Company of Atlantic Highlands, N. J., is now in the midst of a construction program involving the expenditure of $175,000, the program including the construction of a new 750,000 cu. ft. holder, to be erected at a cost of $117,600.

The work on this holder at the present time is about 15 per cent complete, but it is expected to be placed in service about June 1, 1925.

Other items included in the present plans are the installation of a 20x22x21 Duplex Laidlaw Feather Valve gas compressor, at a cost of $25,000; the laying of almost two miles of 6 in. main from the Matawan station to Freneau, and the installation of a service to each residence, at a cost of about $p0,000; and also the extension of a 4 in. main from Atlantic Highlands to Highlands, a distance of over two miles, at a contemplated cost of about $12,000.

Upon the completion of the present program, the total expenditures of the company since the reorganization on February 1, 1922, will amount to $400,000 for improvements. The company, which serves a large territory from Highlands to Freehold, N. J., has installed 1,200 new services and 1,400 new meters within the past three years.

Business Men Honor Gas Manager

Howard A. Stockton, vice-president and general manager of the County Gas Company, has been elected president of the newly-formed Lions Club of Atlantic Highlands, N. J.

W. J. Roberts Resigns

Mr. Walter J. Roberts, formerly superintendent of collections of the County Gas Company, has recently resigned his position, to reenter the dry goods and men's furnishing business at Atlantic Highlands. Mr. Roberts will assume the duties of vice-president and general manager of the Roberts & White, Inc., on February 1, when that corporation takes over the business formerly conducted under the name of Roberts & White.

Contracts Awarded

The Nebraska City Gas Company of Nebraska City, Nebraska, are making extensive additions to their gas plant, consisting of a new water gas set, boiler, purifiers, condenser, oil storage tank and other apparatus, the contract for which has been placed with the Western Gas Construction Company of Fort Wayne, Indiana.

The Illinois Power Company of Springfield, Illinois, have placed a contract with the Western Gas Construction Company of Fort Wayne, Indiana, for an automatic feeding and weighing device for use in connection with the Howard charger, which is being installed at their new plant at Springfield, Illinois.

The Detroit City Gas Company of Detroit, Michigan, recently placed a contract with the Western Gas Construction Company for a quantity of welded steel pipe, which is now being installed at that plant.

Two 12 ft. water gas sets for the Montreal Light, Heat & Power Company of Montreal, Canada, have been completed and are now in operation. These sets were furnished and erected by the Western Gas Construction Company of Fort Wayne, Indiana.

Changes in U. G. I. Organization

C. W. Hunter, formerly gas engineer of Stone & Webster, and recently vice-president of Davis & Farnum Mfg. Co., has been appointed assistant to the president of the U. G. I. Contracting Co., Philadelphia, Pa.

W. A. Norris, on January 1, became a member of the staff of J. A. Perry, gas engineer, the United Gas Improvement Co., Philadelphia, Pa. Mr. Norris was formerly manager of the Peru, Ind., plant of the Northern Indiana Gas & Electric Co.

Christmas Party for F. H. Hill

His associates in the Elmira Water, Light and Railroad Company recently gave Frederick H. Hill, vice-president and general manager of the company, a Christmas party. Moving pictures, entertainment and dancing featured the program. Refreshments were served.

Mr. Hill's work in the gas end of this company's business is summarized as follows:

"In the gas end of our business, Mr. Hill's big accomplishment was the construction (in record-breaking time) and placing in successful operation, of one of the most modern and efficient gas plants in

Frederick B. Hill

the country. While this plant was not built until 1922, it had been Mr. Hill's ambition ever since he first came here to give Elmira the adequate gas service that a progressive community requires. Various conditions beyond Mr. Hill's control prevented this ambition from being realized sooner. Now that we have good gas service, we are in a position to develop the gas business, which should have a growth similar to that of the electric department in the past ten years.

Rates Approved for Westchester Lighting Company

Albany, N. Y.—The Public Service Commission has approved new rates of the Westchester Lighting Company for gas service supplied in the newly established Edge-

mont district, etc. Schedule filed to become effective December 18, 1924, provided the following rates to apply until the sales of gas to consumers served in Scarsdale district have amounted, during 12 consecutive calendar months, to at least 45,000,000 cubic feet of gas per year.

Rate per 100 cubic feet for first 100 cubic feet and per thousand cubic feet for balance of monthly consumption:

First 100 cu. ft., 80c.
Next 100,000 cu. ft., $1.95.
Next 200,000 cu. ft., $1.90.
Next 300,000 cu. ft., $1.85
Next 400,000 cu. ft., $1.80.
Over 1,000,000 cu. ft., $1.75.

Joseph E. Nute Retires as Manager of Fall River Gas Co.

Joseph E. Nute, who retired as manager of the Fall River Gas Works Co. on January 1, after having completed 35 years of service with the company, was the guest at a dinner party which 30 of his friends gave in his honor. Executives from many gas companies in Massachusetts were in attendance and a watch, suitably engraved, was presented to him.

Mr. Nute engaged with the gas company in April, 1890, and has guided the growth of the company from its moderate size at that time to its present great system. The company's records show that in 1890 1,153 gas meters were in use and at the present time the number is nearly 32,000. In 1890, the company manufactured about 50,000,000 cubic feet of gas and in 1924 the figure will amount to over 900,000,000 cubic feet.

Graduating from Massachusetts Institute of Technology as a civil engineer in 1885, Mr. Nute was offered a position with the United Gas Improvement Company of Philadelphia in July of that year by Alexander C. Humphreys, one of America's foremost gas engineers at that time, and general manager of the company. After spending only six days in Philadelphia, Mr. Nute was sent to Omaha, Neb., to superintend the construction of the brick holder tank for a large gas holder. He then superintended similar jobs at Allentown, Pa., and Lewiston, Me., after which he was transferred to Jersey City to assist in the operation of the gas company which had just been organized as a consolidation of the three existing companies.

Mr. Nute was placed in charge of the distribution department of the company in the spring of 1887 and remained with that company until April, 1890, when he was sent here as superintendent of the gas company, which was then controlled by the United Gas Improvement Company. George P. Brown was the manager, but Mr. Nute assumed the operating responsibility. He acquired the title of manager in July, 1902, when its ownership changed hands, and it was placed under the executive management of Stone & Webster of Boston. Mr. Nute is a member of the American Gas Association, a member and past vice-president of the New England Association of Gas Engineers, and a member of the New England Guild of Gas Managers, of which he was president for two years.

Expansion of Gas Company

Eight million dollars have been used by the Southern California Gas Company during the last 19 months on additions and betterments. Bonds and stocks have been issued by the company, and an increasing number of men and women are expressing their belief in the stability and integrity of the company by purchasing them. Such steady, healthy growth as this is a sign of vitality and strength.

These additions have consisted in mains, storage facilities, ground and buildings, and various additions to the distributing system and machinery.

Public Service Corporation of New Jersey Operating Statement

A comparative statement of combined results of operations of the Public Service Corporation of New Jersey and subsidiary companies for the month of October and for the twelve months ending October 31, shows that operating revenues of subsidiary companies in October, 1924, amounted to $7,920,470.76, as against $7,065,532.52 for October, 1923, an increase of $854,938.24. Net increase in surplus before dividends was $712,401.13, an increase of $234,836.62.

For the twelve months ending October 31, 1924, revenue was $86,309,063.39, as against $78,761,161.26 for the preceding twelve months, while net increase in surplus was $7,321,945.71, as against $5,160,077.03 for the previous twelve-month period.

Net increase in surplus before dividends of $7,321,945.71 does not include adjustment of surplus due to sale of real estate which, after deduction of charges in connection with financial reorganization, result in an additional net increase in surplus.

Stevens & Wood Acquire Saugerties Gas Company

The interests in the Saugerties Gas Light Company of William R. Kenan, Jr., of Lockport, N. Y., and R. G. Goodman, of Marinette, Wis., have been acquired by Stevens & Wood, Inc., who are public utility engineers and operators, with headquarters in New York City.

Stevens & Wood, Inc., manage gas and electric lighting properties in other parts of the country, principally in eastern Ohio, western Pennsylvania and Canada. This engineering organization will be of considerable assistance in working out technical problems in connection with the development and extension of the property.

There will be no change in the policy of the company, which will continue to give the same high class service which it has in the past.

The executive officers of the company are: H. A. Clark, president; Thomas F. Walsh, vice-president; Miss K. R. Turck, assistant treasurer; William I. DuBois, commercial manager.